PM FSS

UNITED STATES ARMY
PRODUCT MANAGER
FORCE SUSTAINMENT SYSTEMS

Product Manager Force Sustainment Systems

Contingency Basing and Operational Energy Initiatives

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Report Documentation Page

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Outline

- The Problem
- Contingency Basing (CB) Objective
- Strategic Overview
- CB & Operational Energy (OE) Lines of Effort (LOE)
- Life Cycle of Contingency Bases
- Army Power and Energy
- Efficiency & Environment Initiatives
  - Base Camp Integration Lab (BCIL)
  - Ongoing Assessments at BCIL Energy Efficient Products
  - Energy Efficient Rigid Wall Structures & Tent Liners
- Questions

The Problem

The Army's basing approach is undefined

Current solutions create:

- **Unaffordable logistical burdens**
- **Increased risk to our soldiers**
- **Cause unacceptable loss of our combat manpower to staff and operate bases**

Contingency Basing Objective

- Base Camps become a **Force Multiplier**
- Base Camp Operations **Reduce Casualties**
- Base Camps become a **Combat Multiplier**

- Reduced Resource Requirements
- Improved Operational Sustainability
- Better Functional Systems and System of Systems Management
- Improved Deployability
- Increased Modularity, Scalability, Adaptability, Reusability, Durability, and Reliability of components and system of systems
- Enhanced Survivability
- Improved Training

Problem

Soldier Vulnerability

Ad Hoc & Expensive to Operate

Limited Field Quality of Life

Decreased Soldier Mission Availability

System of Systems Engineering Approach

Payoff

Increased Mission Effectiveness & Efficiency

- •50% increase in troop to task ratio
- •50% decrease in time required to establish perimeter security
- •50% reduction in fuel consumption
- •90% reduction in water resupply demand

The Army will synchronize and integrate contingency basing policy and DOTMLPF solutions in JIIM environments to provide safe, secure, and largely self-sustaining capabilities to support full spectrum operations

Strategic Overview

Key Strategic Documents

29 Jul 11

Operational Energy - Initial Capabilities Document (ICD)

Army Energy Security Implementation Strategy (AESIS)

13 Jan09

CENTCOM Operational Energy Documents

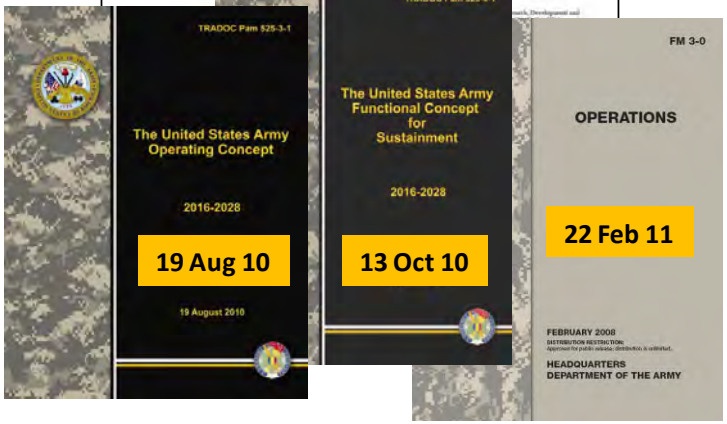
AR 5-5 Study

Tactical Fuel and Energy Implementation Plan

24 September 2010

Army Power and Energy White Paper

1 Apr 10

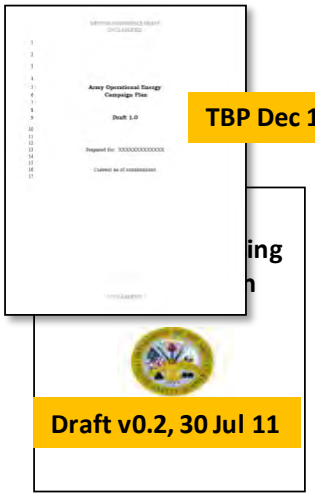


19 Aug 10

13 Oct 10

22 Feb 11

OE Campaign Plan



TBP Dec 11

Draft v0.2, 30 Jul 11

CB Campaign Plan

DICR's and Joint ICD

Army Campaign Plan

Draft 16 Aug 11

Campaign Objective 2.0

Provide Facilities, Programs & Services to Support the Army and Army Families

2-8 Institutionalize Contingency Basing

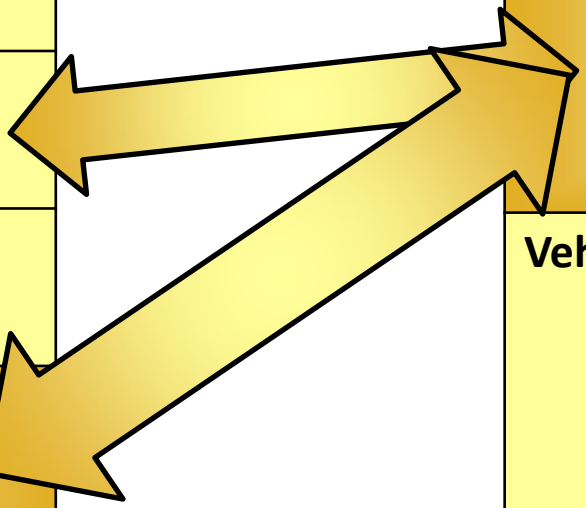
Campaign Objective 8.0

Improve Energy Security and Sustainability

Major Objective 8-2 Enhance Operational Energy Effectiveness & Operational Sustainability

CB & Operational Energy (OE) Lines of Effort (LOE)

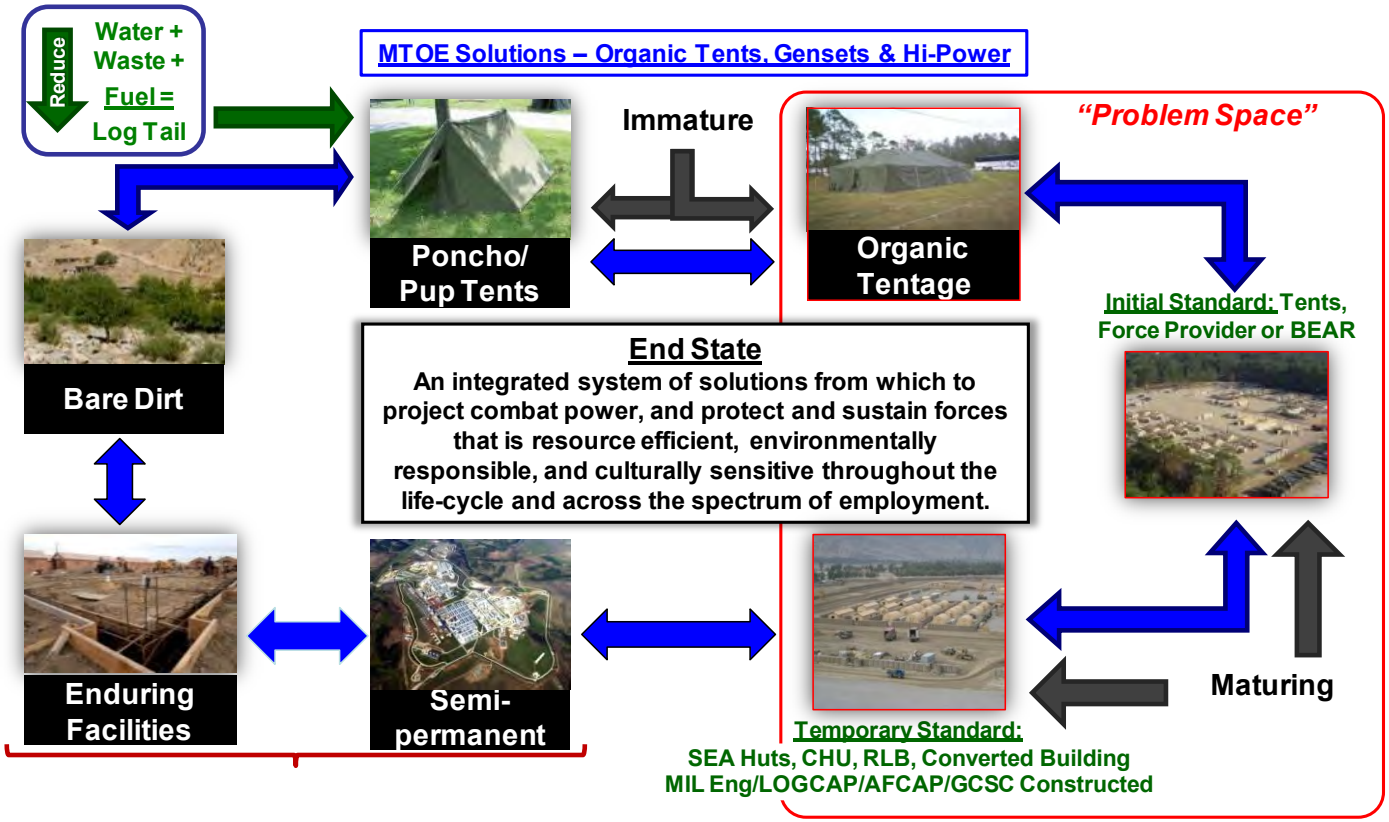
CB Lines of Effort	OE Lines of Effort
LOE 1: Strategic Integration	Soldier Power
LOE 2: Protection	
LOE 3: Sustainment (-)	Basing Power
LOE 4: Engineering	
LOE 5: CB Management	Vehicle Power
LOE 6: Operational Energy	



Life Cycle of Contingency Bases

Contingency Bases

- Provide Support for Sustained Operations
- Evolving locations
- Non-permanent
- Multi-Service
- Defined perimeter
- Established access controls



Army Power and Energy

Army Power and Energy
Every Soldier An Energy Manager

PM FSS Problem Space

- **Basing**
  - Installation
  - Contingency
- **Soldier**
- **Vehicles**
  - Tactical
  - Non Tactical
  - Air
  - Land

OPERATIONAL ENERGY

NET ZERO STRATEGY

Efficiency & Environment Initiatives

Fort Devens Base Camp Integration Lab (BCIL)

Efficiency & Environment Initiatives
Fort Devens Base Camp Integration Lab (BCIL)

• **Goal:** Support the evaluation of current and future integrated expeditionary CB solutions, and provide systems data (technologies, training, installation, maintenance, etc.) to support rapid fielding of systems integrated into currently deployed, developmental, and future expeditionary basing solutions.

• **Benefits:**

- **Integrate and assess new technologies, materials and/or methods in a realistic environment**
- **Enhances the Warfighter's ability to execute the mission by aligning troop to task ratios**
- **Improves our ability to create efficiencies in power, water and waste management**
- **Provides data to substantiate and support all aspects of contingency basing**

Efficiency & Environment Initiatives
Ongoing Assessments at BCIL

- **Power Generation: Micro-Grids:**
  - Provide solutions that reduce the amount of fuel required to generate power for contingency bases
- **Right-Sized, Efficient Environmental Control Units and Heaters**
- **Solar Shades:**
  - Immediate energy savings
  - ULCANS now; fitted ULCANS coming soon
- **Energy-Efficient Rigid Wall Structures:**
  - Lightweight, deployable, rigid-wall and thermally insulated
- **Insulated Tent Liners:**
  - Optimize energy savings by increasing effectiveness of cooling & heating units

Efficiency & Environment Initiatives
Energy Efficient Rigid Wall & Tent Structures

- **Goal: Improve system insulation and reduce the BTUs supplied for cooling & heating**
- **Currently assessing tent liners (R-values 4 to 6) and rigid wall shelters (R-values 20 to 30+)**
- **Intersection of Operational Energy & Contingency Basing initiatives**

ENERGY EFFICIENT INITIATIVE: ENERGY EFFICIENT STRUCTURES

Investigating lightweight deployable, rigid wall, thermally insulated structures or alternative technologies for energy conservation and thermal efficiency.

These EES structures may replace soft walled shelters or other existing shelters employed in theater and throughout the world today.

IMPROVED ENERGY EFFICIENCY OF RIGID WALL STRUCTURES:

- Increase energy efficiency
- Containerized, Deployable, Re-useable, Expeditious
- Minimize logistics: weight, packing, & manpower to employ
- Assessing Industry solutions at Ft Devens CB SIL

ENERGY EFFICIENT INITIATIVE: LINERS

Insulated Tents will Reduce Fuel Consumption by Helping to Maintain a Habitable Temperature Conditions within Army Deployed Shelter Systems

OPTIMIZE ENERGY SAVINGS:

Improve insulation to increase effectiveness of cooling units in summer & heating units in winter

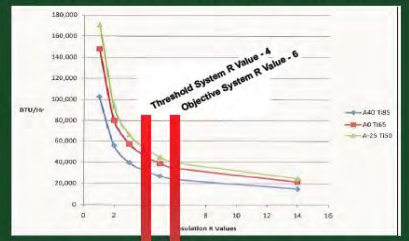
EXTREME WEATHER INSULATED LINERS FOR TENTS:

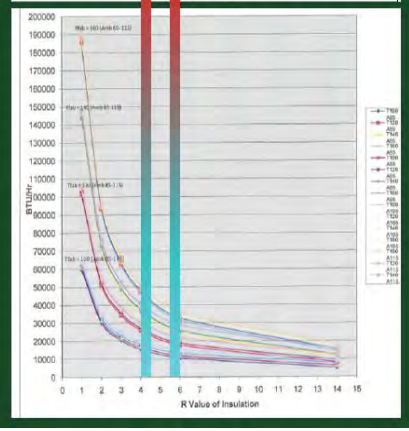
- Retain heat during winter
- Reduce external heat load during summer
- Reduce fuel consumption
- Testing liner systems with R values of 3 to 6

	Class of Insulation	System R Value Range	Weight Range (oz/sq yd)
MATURE: Ready To Field	Single Ply (fielded configuration)	2	4.5
	Non-Woven Composites (variety of batting materials)	2 to 4	10 to 17
	Bubble Packs	2.5 to 5.5	10 to 20
	Fiberglass Cloth, Batting & Film Composites	3 to 6	20 to 30
Developmental	Polyethylene Foams	2.5 to 3.5	7 to 11
	Cellular Panels	4 to 6	10 to 12

ENERGY EFFICIENT INITIATIVE: LINERS

TENT HEATING:
BTU/HR / R-VALUE VS. AMBIENT / INTERIOR TEMPERATURES





Questions

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BACK-UP SLIDES

Way-Ahead: Testing & Evaluation

- **Rigid Wall Shelters – (May ~ Sep 2011)**
  - Determine the energy efficiency of various Rigid Wall Shelter alternatives.
- **Soft Side Shelter Energy Efficiency Short Test – (Sep 2011)**
  - Two week test to determine if solar shades and insulated liners reduce the solar load/temperature increase in soft side shelters. Additionally to determine if downsizing the standard FP ECU can comfortably sustain interior temperatures in the soft side shelters.
- **Soft Side Shelter Energy Efficiency Large Scale Test – (FY12)**
  - Side by side comparison test between various insulated liners to determine the best efficiency and pack out requirements to support Force Provider Air Beam Tents.
- **Base Camp Baseline – (Sep 2011)**
  - Determine, balance and calibrate the power, fuel and water usage requirements between the two 150 man camps within the Base Camp Integration Lab.
- **Micro Grid Test – (Sep 2011/Feb 2012)**
  - Determine the efficiency and energy (fuel) savings in adoption of a micro grid power grid within a 150 man base camp environment using 6 MEP 806B generators.

Way-Ahead: Testing & Evaluation (continued)

- **SAGE Photovoltaic - (FY12)**
  - Determine the effectiveness of photovoltaic system feeding to a commercial hybrid micro grid system
- **SAGE Micro Grid – (FY12)**
  - Test and evaluate the effectiveness of a commercial hybrid micro grid system with energy storage system (batteries) in providing support of base camp operations
- **SAGE Rigid Shelters – (FY12)**
  - Determine the energy efficiency/savings (fuel) of various rigid wall shelter systems in support of base camp operations as compared to soft side shelters.
- **SAGE Solar Hot Water – (FY12)**
  - Evaluate and determine energy savings (fuel) through use of a solar hot water production to supplement conventional water heat
- **Small Incinerators – (TBD)**
  - Evaluate the capability, safety, efficiency, and adaptability of small incinerators to dispose of solid waste within a base camps operations.